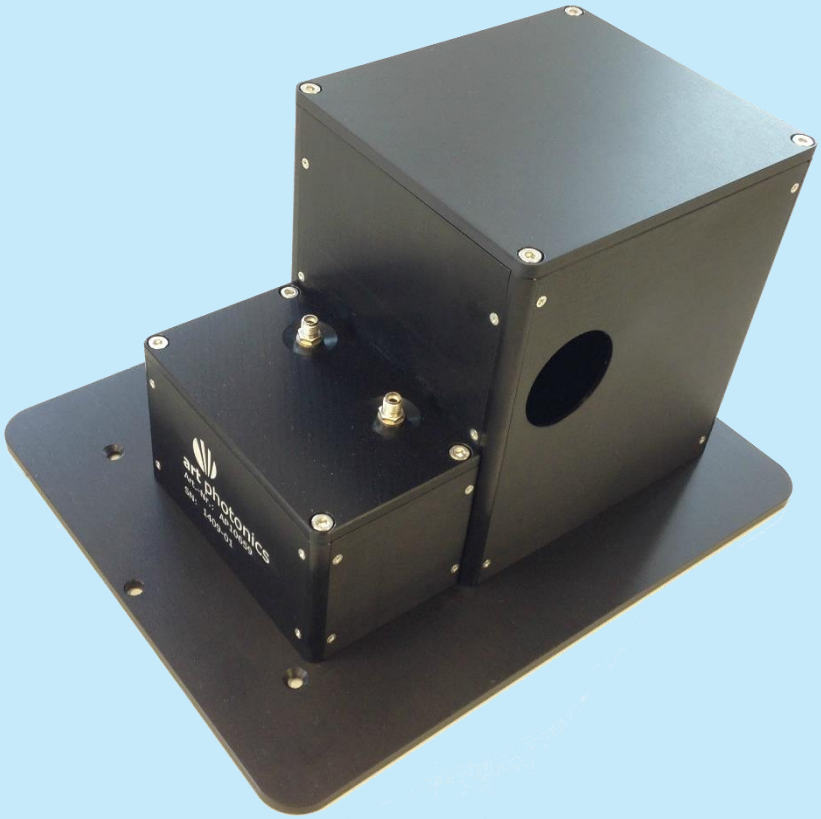
User manual

Fiber Probe Coupler FPC-6M

Senary-mirror Fiber Probe Coupler
suitable for Nicolet iS10(50),
Nicolet 6700 & Avatar 360
FTIR spectrometers



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3 Introduction

I Introduction

The Fiber Probe Coupler FPC-6M is a product of **art photonics** GmbH.

It is intended to attach any fiber cable or fiber probe terminated with SMA905 connectors to the spectrometer Nicolet iS10(50), Nicolet 6700 & Avatar 360 from Thermo Scientific.

I.1 Safety Instructions

These units are not designed for use in hazardous areas.

The units supplied should not be repaired by anyone other than **art photonics** engineers or technicians authorized by **art photonics**.

In case of operation trouble, please address to our Customer service department using the form for Confirmation on Decontamination [abbr.: Attachments].

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Conditions for operation!

To operate the fiber probe coupler with a spectrometry system, all specified conditions have to meet the requirements. Otherwise trouble or defects may occur.

Sensitive optical elements!

Please note the advice given below concerning the handling of sensitive optical elements.

Spare parts!

Only use original spare parts. If it is necessary to change parts not listed in the following chapters, please refer to art photonics customer service. Do not repair or change parts which are not explicitly mentioned in this manual.

Components designed to fit together!

Always use the spectrometer units which have been assembled for you at the original installation. Only use original spare parts. If it is necessary to change parts not listed in the following chapters, please refer to art photonics customer service. Do not repair or change parts which are not explicitly mentioned in this manual. Always contact art photonics Customer Services if you are considering an exchange.

Record the operating parameters of your spectrometer setup

The operating parameters of the system should be checked, defined and recorded each time a change is made to the measurement system (e.g. change of parabolic mirrors, precision sliders etc.). This can either be done by carrying out the measurements described in the following chapters or individually defined standard measurements.

I.2 Safety type and class

The modular spectrometer systems or accessories were constructed and tested according our test procedures and left our factory in perfect technical condition according to related safety regulations. If this condition is to be maintained and in order to guarantee safe operation, you must comply with all advice and warning notes in this manual.

I.3 Customer service and warranty

With the exception of o-rings and protective caps changes as well as the maintenance and service tasks mentioned in the following chapters, it is not allowed to service or repair components or accessories. In case of self-service the guarantee by art photonics will be no longer valid.

Only the manufacturer and persons authorized by the manufacturer are permitted to carry out repairs.

Please contact Customer Services in case of problems with your system or individual components.

5 Introduction

I.4 Operating conditions

Install your device with Fiber Probe Coupler in easily accessible place.

Avoid contact of inside of the coupler with water or chemicals.

Protect optic elements against dirt.

Environmental temperature for the coupler (not for coupled equipment): + 0°C to +50°C

Working temperature for the coupler (not for coupled equipment): 0°C to +50°C

Do not use this Fiber Probe Coupler in hazardous areas.

I.5 Storage and Transport

Before starting the accessory the specified temperature range has to be reached. Therefore allow the accessory to acclimatize for at least 0.5 hours to its new environment. Store the coupler in dry places only. No further safety measures are required. Although the components are robust, jolts and rough handling should be avoided.

I.6 Handling fiber probe couplers and cables

Handle all mirrors with care.

- Do not touch optical surface of all mirrors with fingers/napkin/any tool! The surface can be easily scratched resulting in reflection (transmission through the coupler) drop.

- Do not unscrew the screws! Especially at the bottom of the coupler. Except on *Lid 1* and *Lid 2* for alingment (see Specifications and Installation).
- Do not rinse fiber coupler. Do not immerse fiber probe coupler into liquids. The fiber probe coupler is not sealed thus the penetration of water or chemicals inside the coupler will result in it‘s damage. Ask the manufacturer for the advice if fiber probe coupler need cleaning.

Handle fiber cable with care.

- For optical reference cable in use: avoid tension, torsion and bending for radius less than 50mm. Hold the connector not cable protective tube when pulling it out of the adaptor. For handling with other optical cables and probes refer to handling rules for them.

- Store fiber probe coupler which is not in use in its protective storage cartons.
- Prevent the drop of the coupler.
- Be careful inserting the fiber cable into the coupler.

II Specifications

Fiber Probe Coupler FPC-6M is intended to attach any fiber cable or fiber probe terminated with SMA905 connectors to FTIR-spectrometers: Nicolet iS10(50), Nicolet 6700 & Avatar 360.

II.1 Mechanical parts

Total length:	198 mm without base plate, 255 mm with base plate
Total height:	145 mm without base plate, 150 mm with base plate
Total width:	110 mm without base plate, 209 mm with base plate
Axis-to-axis:	48 mm (between fiber connectors)
Connectors:	SMA905
Case material:	Aluminium alloy (black anodized)
Weight:	2.5 kg

II.2 Optical parts

II.2.1 Ellipsoidal metallic coating mirrors

Diameter: Ø 42 mm
Focus: 25 x 160 mm
Coating: Gold

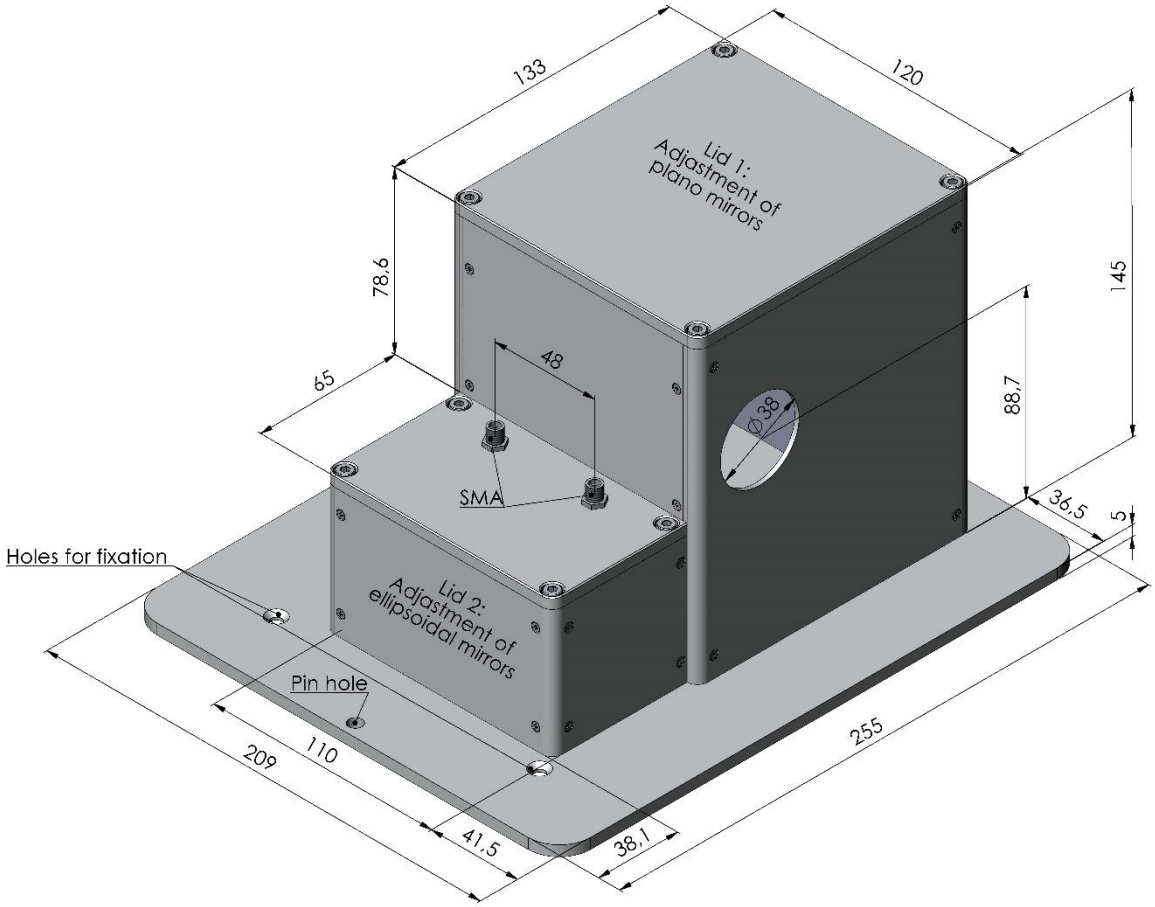
II.2.2 Plano metallic coating mirrors

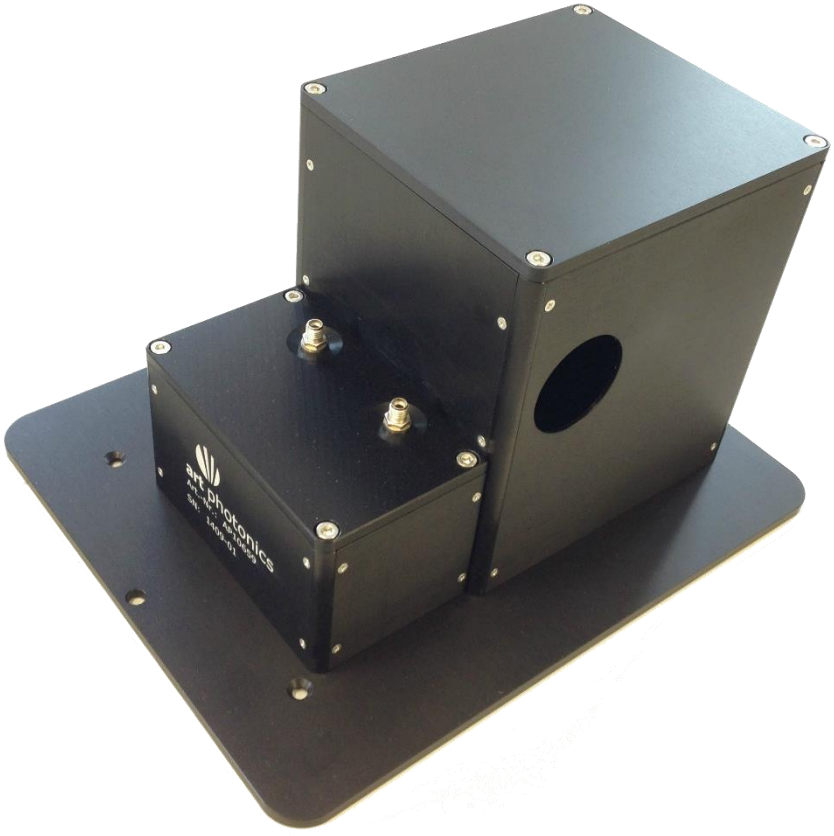
Diameter: Ø 25.4 mm
Coating: Gold

II.2.3 Right angle metallic coating prism mirrors

Leg dimension: 20 mm
Coating: Gold

7 Specification



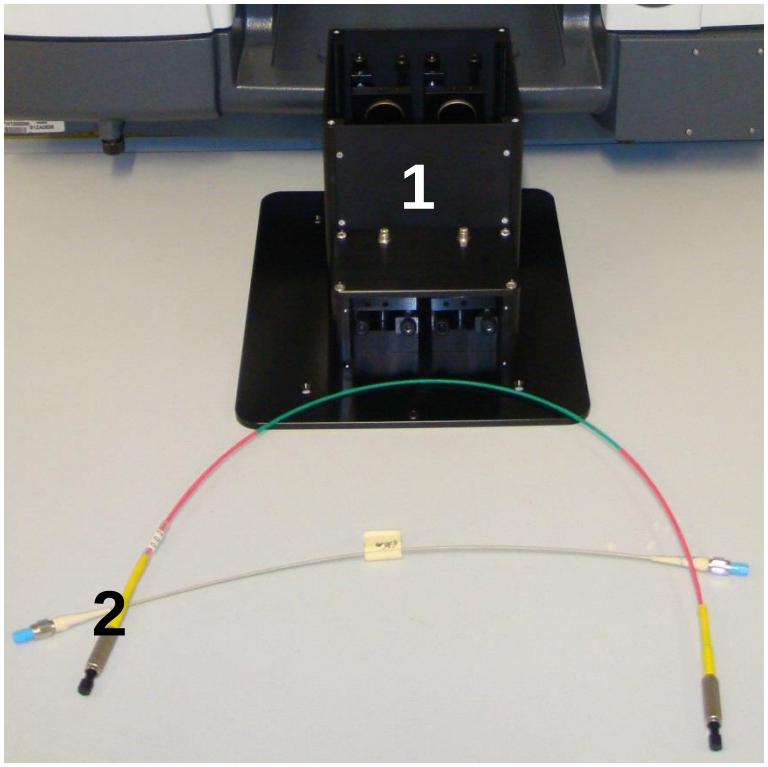


III Content of Delivery

The Fiber Probe Coupler FPC-6M package should include the following items:

1 x Fiber Probe Coupler (1)

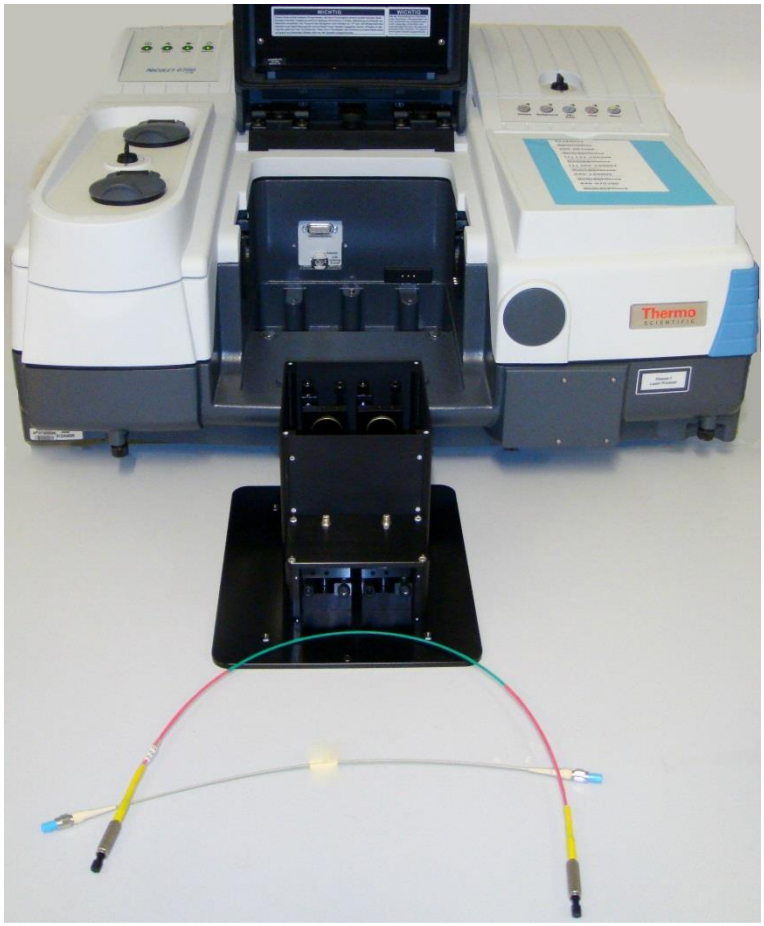
1 x Reference fiber cable: CIR-cable or PIR-cable (2)



9 Installation of the Coupler

IV Installation of the Coupler

The pictures below explain step by step how to insert and adjust the coupler to Nicolet 6700 FTIR-spectrometer (the same procedure for other spectrometers). Some important issues are mentioned as well. The following picture shows which parts are needed to install the fiber probe coupler.



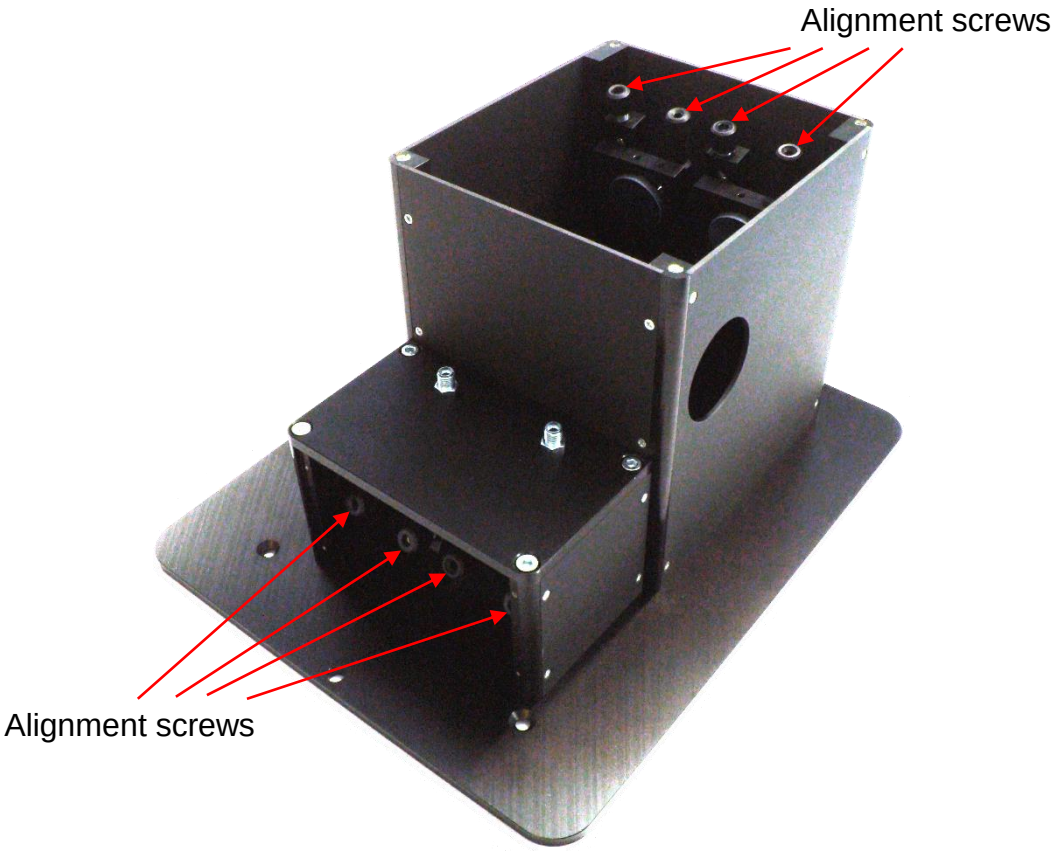
1. Spectrometer Nicolet iS10(50), Nicolet 6700 or Avatar 360.
2. Reference cables PIR 400/500 or CIR 250/300
3. art photonics coupler FPC-6M.

Do not disassemble the coupler! For alignment you can open only *lids 1 and 2* (see specification).

Do not touch the mirrors by hand! It could result in poor coupling efficiency.

IV.1 Opening the lids

To have access to alignment screws open top (*Lid 1*) and front (*Lid 2*) lids of the coupler.



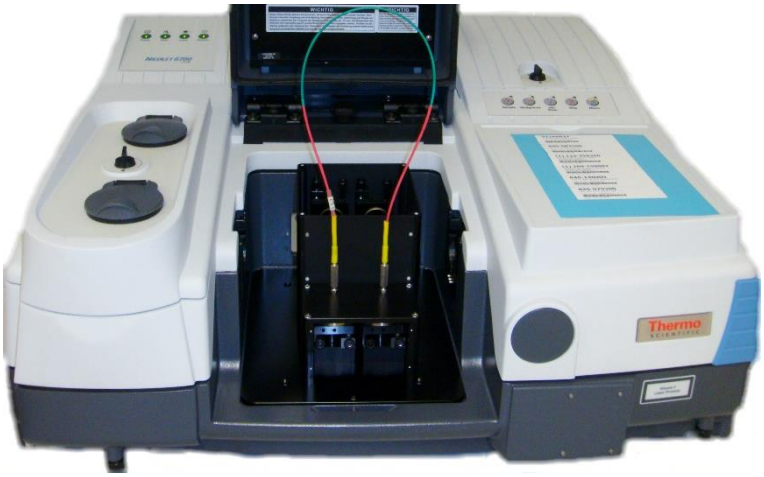
IV.2 Positioning of the coupler

Insert the coupler into sample compartment of the spectrometer. It should not move or rock. Tighten the fixing screws.

IV.3 Connecting the reference cable

The next step is to insert the reference cable connectors into SMA adaptors of the coupler.

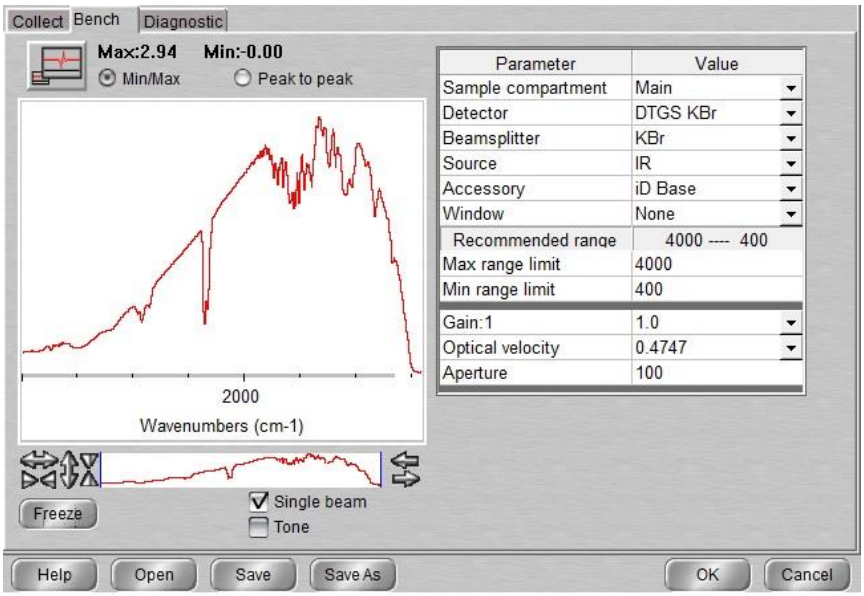
11 Installation of the Coupler



The preparation is ready for the alignment of fiber probe coupler to get highest signal possible.

IV.4 Fiber Probe Coupler alignment

At first switch the spectrometer and computer on. Start *'Omnic'* software and switch it on *Expt set* → *Bench* → *Single Beam*. Next Figure shows the alignment mode (Single Beam).



The coupler is delivered with pre-aligned mirrors! Minor additional adjustment is only needed. The alignment should start with 2 output mirrors using 4 black screws on the left side: 2 for plano mirror and 2 for ellipsoidal mirror. Afterwards align the screws on the right side to optimize position of mirrors at the light source. When the highest signal is reached close the lids (*Lid 1* and *Lid 2*).

The whole alignment must be done carefully. Don't align too fast because the response of detector is delayed.

Normally the adjustment can be done once then only slight correction is necessary for any other attachment of fiber cables and probes. However, make the correction of optimal mirrors positions for better signal and reproducible measurement results.

IV.5 Storage configuration

- Put the protective caps onto the SMA connectors.
- Put the protective caps onto the windows on both sides of the coupler.
- Store the reference cable with the Fiber Coupler.

13 Service and Maintenance

V Service and Maintenance

V.1 How to store the Fiber Probe Coupler safely

If not in use then the Fiber Probe Coupler should be stored in a dry place. Protection against dust is recommended.

Store the reference cable with Fiber Probe Coupler.

V.2 Cleaning of mirrors

Clean the mirrors only with compressed air flow.

V.3 Spare parts

Reference cable	AP 10156 or AP 10158	on request

VI Trouble Shooting

Too low signal

- Check the system using reference cable with known signal
- Check fiber ends quality at both ends of the cable/probe
- Check surfaces of all mirrors
- Check if the connectors are in good condition.

No signal

- Check position of the coupler in the spectrometer

15 Attachments

VII Attachments

VII.1 New safety regulations for servicing laboratory equipment

VII.2 Confirmation on Decontamination

Form sheet for return

VII.3 Test Reports and Material Certificates

NEW SAFETY REGULATIONS FOR SERVICING LABORATORY EQUIPMENT

Dear Customer,

For instruments used in analytical laboratories (e.g. bio-, chemical- or pharmaceutical environment) it cannot be ruled out that service personnel could be exposed to health risks by coming into contact with residues of hazardous substances, especially when the instrument or accessories have been used for making measurements using radioactive, infectious or toxic substances.

The current regulations and laws, as well as the extended guidelines and norms, stipulate that we, as a manufacturer of measuring systems, observe more stringent safety regulations in order to ensure the safety of our employees. These regulations and laws include:

- The chemicals ordinance for protection from hazardous substances
- The hazardous substances ordinance, technical rules for hazardous substances
- The radiological protection ordinance
- The accident prevention regulations biotechnology, safety tests concerning biological safety according to UVV, VBG 102
- The guidelines of the professional associations, working in contaminated areas

Moreover, the environmental regulations issued by the environmental protection and industrial inspection board as well as the quality assurance system DIN/ISO 9001, which was awared to J&M, also have to be observed.

Therefore, prior to allowing any repair work in your laboratory or before returning the instrument to us we would ask you, either to carefully clean, disinfect or decontaminate the instrument or components to be serviced, or confirm that the instrument or components have not come into contact with any hazardous substances.

The enclosed “Confirmation on Decontamination” should be filled out and attachet to the Shipping papers together with your repair order, or handed out directly to our service technicians in your laboratory.

We are unable to commence repair work without a declaration that the instrument has been decontaminated. Should the declaration not be received within three weeks we regret that we must for safety reasons return the instrument unrepaired, at your cost.

For further questions, please do not hesitate to contact us directly.

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Confirmation on Decontamination

If you return an instrument or component (e.g. accessory) to AP for sevicing purposes which is not properly decontaminated, there will be a health risk for AP employees. We therefore need your confirmation that the instrument or component was decontaminated and cleaned properly before shipping. If the form below is not filled in accordingly and completely, we will reject the instrument. This is needed to protect our employees. We kindly ask you for your understanding.

Instrument / component _____	Serial no. _____
Instrument or component has come into contact with:	
[ ] radioactive substances Isotope_____ _____	How decontaminated / cleaned: _____ _____
[ ] chemical reagents R-and S-rules_____ _____	How decontaminated / cleaned: _____ _____
[ ] biological material specifiy_____ _____	How decontaminated / cleaned: _____ _____
[ ] contagious agents specify _____ _____	How decontaminated / cleaned: _____ _____
[ ] I hereby confirm that the instrument or component specified above was not contaminated with any of the above mentioned substances / reagents / agents [ ] I hereby confirm that the instrument or component specified above was decontaminated / cleansed using the appropriate method.	
Date:_____	signature:_____
(please print) name:_____ _____ title:_____	address:_____ _____ _____ phone:_____ fax:_____